

## REMARKS

This application has been reviewed in light of the Office Action dated August 1, 2003. Claims 1-15, 17-30, and 33-54 are presented for examination. Claims 16, 31, and 32 have been canceled, without prejudice or disclaimer of subject matter, and will not be discussed further. Claims 1, 2, 6-15, 17, 18, 21-30, and 33 have been amended to define still more clearly what Applicants regard as their invention. Claims 34-54 have been added to provide Applicants with a more complete scope of protection. Claims 1, 15, 17, 33, 36, and 51-54 are in independent form. Favorable reconsideration is requested.

Applicants note with appreciation the allowance of Claims 1-15 and 17-30. Allowed independent Claims 1, 15, and 17 have been amended as to matters of form and to clarify that the identifier for identifying an entry in the index does not have to be stored in the entry, because each entry could instead be addressed by the identifier as described, for example, at page 15, line 23, to page 16, line 5, of the specification.<sup>1</sup>

Claims 2 and 18 were objected to because of the phrase "phoneme-like units". These claims have been amended to delete this phrase.

Claim 33 was rejected under 35 U.S.C. § 101 as directed to non-statutory subject matter and under 35 U.S.C. § 112, second paragraph, as being indefinite.

Claim 33 has been carefully reviewed and amended as deemed necessary to ensure that it conforms fully to the requirements of Sections 101 and 112, second paragraph, with special attention to the points raised in paragraphs 2 and 4 of the Office Action. Specifically,

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<sup>1</sup>It is to be understood, of course, that the claim scope is not limited by the details of the described embodiments, which are referred to only to facilitate explanation.

Claim 33 has been amended to include the feature of identifying means operable to identify the one or more portions of data in the database for comparison with the input query, using keys in the index which correspond to sub-word unit classifications in the input query. It is believed that the rejections under Sections 101 and 112, second paragraph, have been obviated, and their withdrawal is therefore respectfully requested.

Claim 33 was rejected under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 5,675,706 (*Lee et al.*).

As shown above, Applicants have amended independent Claim 33 in terms that more clearly define what they regard as their invention. Applicants submit that this amended independent claim and new independent Claims 36, and 51-54, together with the remaining claims dependent thereon, are patentably distinct from the cited prior art for at least the following reasons.

The aspect of the present invention set forth in Claim 33 is an apparatus for identifying one or more portions of data in a database for comparison with a query input by a user. The query and portions of data each comprise a sequence of sub-word units. The apparatus includes an index having a plurality of entries, each of which includes a key comprising a sequence of sub-word unit classifications. The key is derived from a corresponding sequence of sub-word units appearing in the database by classifying each of the sub-word units in the sequence into one of a plurality of sub-word unit classes. Each class comprises sub-word units that are confusable with other sub-word units in the same class. The apparatus also includes identifying means operable to identify one or more portions of data in the database for

comparison with the input query, using keys in the index which correspond to sub-word unit classifications in the input query.

One important feature of Claim 33 is identifying one or more portion of data in a database for comparison with the query input by a user.

*Lee et al.* relates to automated speech recognition, and in particular, a telephone based automatic speech recognition system which employs an Hidden Markov Model (HMM) sub-word unit speech recognizer and a sub-word unit verification stage which verifies the sub-word units output by the HMM recognizer. However, nothing has been found in *Lee et al.* that would teach or suggest an apparatus for identifying one or more portions of data in a database for comparison with a user query or identifying means operable to identify the one or more portions of data in the database for comparison with the input query, using keys in the index which correspond to sub-word unit classifications in the input query, as recited in Claim 33.

For at least this reason, Applicants strongly believe that Claim 33 is allowable over *Lee et al.*

The aspect of the present invention set forth in Claim 52 is an index for use in searching a database. The index has a plurality of entries, each of which has an associated identifier for identifying the entry and at least one entry which includes a key which is related to the identifier in a predetermined manner and one or more pointers which point to locations within the database corresponding to the key for the entry. Each key comprises a sequence of sub-word unit classifications which is derived from a corresponding sequence of sub-word units appearing in the database by classifying each of the sub-word units in the sequence into one of a

plurality of sub-word unit classes. The sub-word unit classes being defined in advance and each comprising sub-word units that are confusable with other sub-word units in the same class.

Nothing has been found in *Lee et al.* that would teach or suggest an index as recited in Claim 52. Although *Lee et al.* describes the use of sub-word unit classes which are defined in advance and include sub-word units that are confusable with other sub-word units in the same class, *Lee et al.* fails to teach or suggest that an entry in the index has pointers which point to locations within the database corresponding to the key for the index entry, as recited in Claim 52. None of the cited prior art are seen to remedy the deficiencies of *Lee et al.*

Accordingly, Applicants believe that Claim 52 is clearly patentable over the cite prior art.

New Claims 53 and 54 are storage medium and program claims, respectively, corresponding to allowed method Claim 17 are also believed to be in condition for allowance.

New dependent claims 34 and 35 have been added and are directed to the way in which the key is related to the identifier in accordance with equation (8) given on page 36 of the specification. New claims 36 to 51 are non-means plus function claims corresponding to allowed means plus function claims 1 to 15 and 34, and are also believed to be in condition for allowance.

A review of the other art of record has failed to reveal anything which, in Applicants' opinion, would remedy the deficiencies of the art discussed above, as references against the independent claims herein. Those claims are therefore believed patentable over the art of record.

The other claims in this application are each dependent from one or another of the independent claims discussed above and are therefore believed patentable for the same

reasons. Since each dependent claim is also deemed to define an additional aspect of the invention, however, the individual consideration or reconsideration, as the case may be, of the patentability of each on its own merits is respectfully requested.

In view of the foregoing amendments and remarks, Applicants respectfully requests favorable reconsideration and early passage to issue of the present application.

Applicants' undersigned attorney may be reached in our New York office by telephone at (212) 218-2100. All correspondence should continue to be directed to our below listed address.

Respectfully submitted,



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